

7

the uppermost blade row illustrated, each blade pair 351A is constructed and arranged according to the first form of the invention. The blade pair 351B is constructed and arranged according to one variation of the third form of the invention. Each blade pair 351C is constructed and arranged according to another variation of the third form of the invention.

Insofar as variations of the third form of blade pairs 351B and 351C are concerned, it will be seen that the variation resides in the direction of inclination of the outer portions 356 of blades 350 in question. The blades 350 in the pairs 351B have both outer blade portions 356 inclined (in the same direction) so as to drive air axially outwardly of the hub 38, as well as rearwardly. Similarly, the blades 350 in the pairs 351C have outer blade portions 356 inclined (in the same direction) so as to drive air axially outwardly, as well as rearwardly.

Each row of blade pairs 351 has at least one, and sometimes as many as three, pairs 351A (the pairs 351 are staggered in different rows). Each has, in addition, at least one pair 351 each of 350B and 350C blade configurations. The effect of this construction is to effect a powerful rearward and laterally outward flow of air from the system 40. Spreading of crop material is further enhanced by this arrangement.

While a preferred embodiment of the invention has been described, it should be understood that the invention is not so limited, and modifications may be made without departing from the invention. The scope of the invention is defined by the appended claims, and all devices that come within the meaning of the claims, either literally or by equivalence, are intended to be embraced therein.

What is claimed is:

1. In a residue handling, system for an agricultural combine, the improvement in a residue chopper comprising:

a housing having an inlet and an outlet, and a hub and blade assembly mounted for rotation in said housing in a first plane parallel to the direction of rotation, said hub having a peripherally cylinder-like surface with a longitudinal axis generally perpendicular to said first plane;

a plurality of mounting posts affixed generally symmetrically to said peripheral cylinder-like surface along and around the longitudinal axis thereof and extending radially therefrom;

a pair of elongated chopper blades pivotally affixed to each said mounting post, each said chopper blade further having an inner flat portion, an outer end portion and an intermediate portion, said outer portion including a front face and a rear face extending substantially parallel to each other and lying at an angle to said first plane, and said intermediate portion bent in a smooth transition between said inner and outer portions such that said front face is inclined at an angle to said first plane and said inner portion lies in said first plane;

said outer portion of each chopper blade has a sharpened leading edge and a trailing edge relative to said direction of rotation;

said leading edges of said outer portions in at least some of said pairs of chopper blades are closer together than said leading edges; and

a plurality of knives are mounted in said housing and extending radially toward said hub such that a knife extends into the path of rotation and between each pair of chopper blades.

2. The residue chopper of claim 1, wherein:

said pairs of chopper blades affixed to said hub are arranged in three patterns along the axial dimension thereof as follows:

8

a first pattern in the middle section of said hub characterized in that said trailing edges of said outer portions of said pairs of chopper blades are closer together than said leading edges;

a second pattern on a first end section of said hub adjacent said middle section characterized in that said leading edges and said trailing edges of said outer portions of each said pair of chopper blades are substantially equidistant from each other, and said front face of each said chopper blade is inclined away from said middle section; and

a third pattern on a second end section of said hub adjacent said middle section, on the opposite end of said hub from said first end section, characterized in that said leading edges and said trailing edges of said outer portions of each said pair of chopper blades are substantially equidistant from each other, and said front face of each said chopper blade is inclined away from said middle section.

3. The residue chopper of claim 2, wherein:

each said mounting post comprises an open-centered generally rectangular stub tube with generally planar outside walls generally parallel to said first plane, and a first opening through said outside walls;

each said chopper blade has a second opening there-through to match said first opening and by which said chopper blade is affixed to respective said mounting posts;

the inner portion of each said chopper blade being flat and parallel to said first plane and seated flush, with a sliding relationship against one of said generally planar outside walls; and

a fastener extending through said first and second openings to affix said pair of chopper blades to respective said mounting posts.

4. The residue chopper of claim 3, wherein:

said face of each said chopper blade is inclined at an angle of five degrees from said first plane.

5. The residue chopper of claim 3, wherein:

said face of each said chopper blade is inclined at an angle of thirty-five degrees from said first plane.

6. In an agricultural combine including a wheel-supported frame, a crop gathering mechanism supported on said frame and adapted to remove crop from the field, a crop threshing mechanism supported on said frame, a crop feeder mechanism interconnecting said crop gathering mechanism and said crop threshing mechanism, a crop residue handling mechanism supported on said frame and adapted to receive crop residue from said crop threshing mechanism, chop it into finer pieces, and spread it on the field, and an engine supported on said frame and adapted to provide motive power to the combine and the various mechanisms supported thereon, the improvement in said crop residue handling mechanism comprising:

a housing having an inlet and an outlet, and a hub and blade assembly mounted for rotation in said housing in a first plane parallel to the direction of rotation, said hub having a peripherally cylinder-like surface with a longitudinal axis generally perpendicular to said first plane;

a plurality of mounting posts affixed generally symmetrically to said peripheral cylinder-like surface along and around the longitudinal axis thereof and extending radially therefrom;

a pair of elongated chopper blades pivotally affixed to each said mounting post, each said chopper blade

9

further having an inner flat portion, an outer end portion and an intermediate portion, said outer portion including a front face and a rear face extending substantially parallel to each other and lying at an angle to said first plane, and said intermediate portion bent in a smooth transition between said inner and outer portions such that said front face is inclined at an angle to said first plane and said inner portion lies in said first plane;

said outer portion of each chopper blade has a sharpened leading edge and a trailing edge relative to said direction of rotation;

said leading edges of said outer portions in at least some of said pairs of chopper blades are closer together than said leading edges; and

a plurality of knives are mounted in said housing and extending radially toward said hub such that a knife extends into the path of rotation and between each pair of chopper blades.

7. The residue chopper of claim 6, wherein:

said pairs of chopper blades affixed to said hub are arranged in three patterns along the axial dimension thereof as follows:

a first pattern in the middle section of said hub characterized in that said trailing edges of said outer portions of said pairs of chopper blades are closer together than said leading edges;

a second pattern on a first end section of said hub adjacent said middle section characterized in that said leading edges and said trailing edges of said outer portions of each said pair of chopper blades are substantially equidistant from each other, and said front face of each said chopper blade is inclined away from said middle section; and

10

a third pattern on a second end section of said hub adjacent said middle section, on the opposite end of said hub from said first end section, characterized in that said leading edges and said trailing edges of said outer portions of each said pair of chopper blades are substantially equidistant from each other, and said front face of each said chopper blade is inclined away from said middle section.

8. The residue chopper of claim 6, wherein:

each said mounting post comprises an open-centered generally rectangular stub tube with generally planar outside walls generally parallel to said first plane, and a first opening through said outside walls;

each said chopper blade has a second opening there-through to match said first opening and by which said chopper blade is affixed to respective said mounting posts;

the inner portion of each said chopper blade being flat and parallel to said first plane and seated flush, with a sliding relationship against one of said generally planar outside walls; and

a fastener extending through said first and second openings to affix said pair of chopper blades to respective said mounting posts.

9. The residue chopper of claim 7, wherein:

said face of each said chopper blade is inclined at an angle of five degrees from said first plane.

10. The residue chopper of claim 7, wherein:

said face of each said chopper blade is inclined at an angle of thirty-five degrees from said first plane.

* * * * *